VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification

The paragraph at page 3, lines 13-20 has been amended as follows:

Optoelectronic packages for optical sensors often include a chip carrier, an optoelectronic chip mounted in a cavity of the chip carrier, and a transparent window positioned above the chip that hermetically seals the cavity and **passes through the incident light to** ~~exposes~~ the chip ~~to the incident light~~. The optoelectronic chip typically includes a light sensitive cell that comprises an array of tiny photosensor elements, such as charge coupled devices (CCDs) or complimentary metal oxide semiconductor (CMOS) photoreceptors. The photosensor elements convert the light energy incident upon them into electrical signals on an element-by-element or pixel-by-pixel basis. These signals convey information about the intensity, color, hue, saturation and other attributes of the incident light.

The paragraph at page 8, lines 21-23 has been amended as follows:

Pads 116 provides bonding sites to electrically couple chip 110 with external circuitry. Thus, a particular pad 116 can be input/output pad or a power/ground pad. Pads 116 have a length and width of 70 microns.

The paragraph at page 10, lines 15-28 has been amended as follows:

FIGS. 2D and **2G** are enlarged cross-sectional views of various features formed in metal base 120 by wet chemical etching using photoresist layers 142 and 144 as etch masks. In particular, the structure is dipped in a wet chemical etch that provides a **back**~~front~~-side etch through the openings in photoresist layer 142 to the exposed portions of surface 122 and a **front**~~back~~-side etch through the openings in photoresist layer 144 to the exposed portions of surface 124. The structure is submerged in the wet chemical etch long enough for the etchant to etch about 120 microns into metal base 120. That is, the wet chemical etch provides a "half-etch" that removes slightly over one-half (120/200) the thickness of metal base 120 at the exposed portions. Thus, the **back**~~front~~-side etch partially forms slot 128, the **front**~~back~~-side etch

partially forms slot 128 and completely forms recessed portion 132, and the combination of the front-side and back-side etches completely forms slot 128. Likewise, the front-side and back-side etches are applied simultaneously, and slot 128 and recessed portion 132 are formed simultaneously. The wet chemical etch also forms the other slots 128 and recessed portions 132 as well as recessed portions 134 and the unlabeled openings and notches in a similar manner.

The paragraph at page 17, lines 18-22 has been amended as follows:

A suitable wet chemical etch can be provided by the same solution used to form slots 128 and recessed portions 132 and 134. The optimal etch time for exposing the structure to the wet chemical etch without excessively exposing the portions of leads 138 embedded in peripheral portion 166 and adjacent to inner side surfaces 174 **after** the selected copper has been removed can be established through trial and error.

The paragraph at page 21, lines 8-17 has been amended as follows:

At this stage, device 186 includes chip 110, conductive traces 150, transparent adhesive 154, connection joints 180 and insulative housing 184. Conductive traces 150 each include a lead 138 that protrudes laterally from and extends through a side surface 162 of insulative housing 184, and a metal trace 144 within insulative housing 184 that contacts an associated lead 138 and connection joint 180. Conductive traces 150 are electrically connected to pads 116 by connection joints 180 in one-to-one relation, and are electrically isolated from one another. Leads 138 are arranged in opposing rows that protrude laterally from and extend through opposing side surfaces 162 and are disposed between top surface 164 and bottom surface 160. Furthermore, light sensitive cell 115 is protected by and **receives** ~~exposed to~~ incident light from the external environment **through** ~~by~~ transparent adhesive 154 and transparent base 182.

The paragraph at page 22, lines 3-6 has been amended as follows:

The light sensitive cell can include a wide variety of light sensitive elements designed to ~~be~~ selectively or continuously **receive** ~~exposed to~~ light in a selected frequency range during normal operation of the chip. For instance, the light sensitive cell can be designed to receive visible, ultraviolet or infrared light, combinations thereof, and selected frequencies thereof.

In the Claims

The claims have been amended as follows:

1. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface and a lower surface, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a first single-piece non-transparent insulative housing portion that contacts the lower surface and is spaced from the light sensitive cell and a second transparent insulative housing portion that contacts the first housing portion and the light sensitive cell, **wherein the first housing portion includes a peripheral ledge, and the second housing portion is located within the peripheral ledge and is exposed**; and

a conductive trace that extends outside the insulative housing and is electrically connected to the pad inside the insulative housing.

6. (Amended) The device of claim 1, wherein the ~~first housing portion includes a peripheral ledge, and the~~ second housing portion is **recessed relative to** ~~located within~~ the peripheral ledge.

9. (Amended) The device of claim 1, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

11. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface, a lower surface and outer side surfaces between the upper and lower surfaces, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a first single-piece non-transparent insulative housing portion that contacts the lower surface and the side surfaces and is spaced from the upper surface and a second transparent insulative housing portion that contacts the first housing portion and the light sensitive cell and is spaced from the lower surface; and

a conductive trace that **extends through an opening in the first housing portion,** extends outside the insulative housing and is electrically connected to the pad inside the insulative housing.

12. (Amended) The device of claim 11, wherein the second housing portion includes first and second opposing surfaces, the first surface contacts the light sensitive cell and **is spaced from** the conductive trace, and the second surface faces away from the chip and is exposed.

13. (Amended) The device of claim 12~~1~~, wherein the first housing portion includes a peripheral ledge, and the second housing portion is located within the peripheral ledge.

15. (Amended) The device of claim 11, wherein the first housing portion is a transfer molded material, and the second ~~single-piece~~ housing portion is a cured polymeric material.

17. (Amended) The device of claim 11, wherein the first housing portion is a transfer molded material that includes a peripheral ledge, and the second housing portion is a cured polymeric material that is located within the peripheral ledge and includes a first surface that contacts the light sensitive cell and **is spaced from** the conductive trace and a second surface opposite the first surface that faces away from the chip and is exposed.

19. (Amended) The device of claim 11, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

21. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface, a lower surface and four outer side surfaces between the upper and lower surfaces, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a top surface, a bottom surface and **uncurved** peripheral side surfaces between the top and bottom surfaces, wherein the insulative housing further includes first and second insulative housing portions, the first housing portion is a single-

piece that provides the bottom surface and is non-transparent, and the second housing portion contacts the upper surface, provides at least a portion of the top surface and is transparent; and

a conductive trace that extends outside the insulative housing and is electrically connected to the pad inside the insulative housing.

25. (Amended) The device of claim 21, wherein the first housing portion is a transfer molded material, and the second ~~single-piece~~ housing portion is a cured polymeric material.

27. (Amended) The device of claim 21, wherein ~~the conductive trace and~~ the light sensitive cell contacts a major surface of the second housing portion that faces towards and is parallel to the upper surface.

29. (Amended) The device of claim 21, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

31. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface, a lower surface and four outer side surfaces between the upper and lower surfaces, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a top surface, a bottom surface and peripheral side surfaces between the top and bottom surfaces, wherein the insulative housing further includes first and second insulative housing portions, the first housing portion is a single-piece that provides the bottom surface, the peripheral side surfaces and a peripheral portion of the top surface, contacts the lower surface and the outer side surfaces, is spaced from the light sensitive cell and is non-transparent, and the second housing portion is a single-piece or double-piece that provides a central portion of the top surface within the peripheral portion of the top surface, contacts the first housing portion, the light sensitive cell and the conductive trace, is spaced from the lower surface, ~~and~~ is transparent **and is exposed**; and

a conductive trace that extends outside the insulative housing and is electrically connected to the pad inside the insulative housing.

32. (Amended) The device of claim 31, wherein the second housing portion includes first and second opposing surfaces, the first surface faces towards the chip and contacts the light sensitive cell and **is spaced from** the conductive trace, and the second surface faces away from the chip and provides the central portion of the top surface and is exposed.

37. (Amended) The device of claim 31, wherein the first housing portion is a transfer molded material that includes a peripheral ledge, and the second housing portion is a cured polymeric material that is located within the peripheral ledge and includes a first surface that faces towards the chip and contacts the light sensitive cell and **is spaced from** the conductive trace and a second surface opposite the first surface that faces away from the chip and provides the central portion of the top surface and is exposed.

39. (Amended) The device of claim 31, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

41. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface and a lower surface, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a top surface, a bottom surface and a peripheral side surface between the top and bottom surfaces, wherein the insulative housing further includes a first insulative housing portion that covers the lower surface and is non-transparent and a second insulative housing portion that covers the light sensitive cell and is transparent; and

a conductive trace that protrudes laterally from and extends through the side surface and is electrically connected to the pad, wherein the conductive trace includes a recessed portion that extends **into the insulative housing** ~~through the side surface~~ and is spaced from the top and bottom surfaces and a non-recessed portion that extends outside the insulative housing and is adjacent to the recessed portion and ~~a corner between the side surface and~~ the top surface.

45. (Amended) The device of claim 41, wherein the first housing portion is a transfer molded material, and the second ~~single-piece~~ housing portion is a cured polymeric material.

47. (Amended) The device of claim 41, wherein ~~the conductive trace and~~ the light sensitive cell contacts a major surface of the second housing portion that faces towards and is parallel to the upper surface.

49. (Amended) The device of claim 41, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

51. (Amended) An optoelectronic semiconductor package device, comprising:

a semiconductor chip that includes an upper surface and a lower surface, wherein the upper surface includes a light sensitive cell and a conductive pad;

an insulative housing that includes a top surface, a bottom surface and a peripheral side surface between the top and bottom surfaces, wherein the insulative housing further includes a first single-piece housing portion that contacts the lower surface and is spaced from the light sensitive cell and a second single-piece housing portion that contacts the first housing portion and the conductive trace and is transparent, the first housing portion alone provides the bottom surface, and the first and second housing portions in combination provide the top surface; and

a conductive trace that protrudes laterally from and extends through the side surface and is electrically connected to the pad, wherein the conductive trace includes a recessed portion ~~inside the insulative housing~~ that extends **into the insulative housing** ~~through the side surface~~ and is spaced from the top and bottom surfaces and a non-recessed portion **that extends** outside the insulative housing **and** ~~that~~ is adjacent to ~~and integral with~~ the recessed portion and contacts the **insulative housing, wherein the recessed and non-recessed portions each include four outer surfaces, three of the outer surfaces of the recessed and non-recessed portions that do not face in the same direction as the top surface are coplanar with one another where the recessed and non-recessed portions are adjacent to one another, and one of the outer surfaces of the recessed and non-recessed portions that face in the same direction as the top surface are not coplanar with one another where the recessed and non-recessed portions**

are adjacent to one another~~side surface and is adjacent to a corner between the side surface and the top surface~~.

52. (Amended) The device of claim 51, wherein the second housing portion includes first and second opposing surfaces, the first surface contacts the light sensitive cell and **is spaced from** the conductive trace, and the second surface faces away from the chip and is exposed.

57. (Amended) The device of claim 51, wherein the first housing portion is a transfer molded material that includes a peripheral ledge, and the second housing portion is a polymeric material that is located within the peripheral ledge and includes a first surface that contacts the light sensitive cell and **is spaced from** the conductive trace and a second surface opposite the first surface that faces away from the chip and is exposed.

59. (Amended) The device of claim 51, wherein the device is devoid of an electrical conductor that extends through **opposing** ~~a~~ surfaces of the second housing portion.

Claims 61-150 have been added.

REMARKS

Claim 1-150 are pending. In this Response, claims 1, 6, 9, 11-13, 15, 17, 19, 21, 25, 27, 29, 31, 32, 37, 39, 41, 45, 47, 49, 51, 52, 57 and 59 have been amended, and claims 61-150 have been added.

I. DRAWING OBJECTIONS – INCONSISTENT FIGURES

The drawings are objected to because various figures are not consistent with one another.

The Examiner asserts that Fig. 6D is not consistent with Fig. 6B and Fig. 7D is not consistent with Fig. 7B, since in Figs. 6B and 7B the leads are not across the top surface of central portion 126, but in Figs. 6D and 7D the leads cross the top surface of central portion 126.

Metal base 120 includes central portion 126, slots 128 and leads 138. Leads 138 extend outwardly from central portion 126 between slots 128 and include recessed portions 132 and non-recessed portions 136, as shown in Figs. 2B and 2H.

Metal traces 144 are formed on metal base 120 and extend from central portion 126 to recessed portions 132 but do not extend to non-recessed portions 136, as shown in Figs. 3A and 3E.

Thus, leads 138 do not overlap central portion 126, and metal traces 144 overlap central portion 126 and leads 138.

In Figs. 6D and 7D, lead 138 does not overlap central portion 126. Instead, metal trace 144 overlaps central portion 126. Therefore, Figs. 6B and 6D are consistent with one another, and Figs. 7B and 7D are consistent with one another. However, in the interests of expediting the case, the Submission Of Proposed Drawing Amendment For Approval By Examiner filed concurrently herewith proposes labeling metal trace 144 in Figs. 6D and 7D.

The Examiner asserts that Figs. 10D and 10E are not consistent with Fig. 10C, since in Fig. 10C metal trace 144 contacts pad 116, but in Figs. 10D and 10E metal trace 144 does not contact pad 116.

Metal traces 144 do not contact pads 116. In Figs. 5A to 5C, chip 110 is mechanically attached to metal base 120 by transparent adhesive 154 such that metal traces 144 overlap and are electrically isolated from pads 116, in Figs. 10A and 10B, openings 176 are formed in transparent adhesive 154 that expose pads 116, and in Figs. 11A and 11B, connection joints 180 are formed on pads 116 and metal traces 144, thereby electrically connecting pads 116 and metal traces 144.

Fig. 10C does not show metal trace 144 contacting pad 116. Instead, metal trace 144 overlaps pad 116, much like Fig. 5C. However, in the interests of expediting the case, the Submission Of Proposed Drawing Amendment For Approval By Examiner filed concurrently herewith proposes showing transparent adhesive 154 between metal trace 144 and pad 116 in Fig. 10C.

Therefore, Applicant requests that these objection be withdrawn.

II. DRAWING OBJECTIONS – MISSING FEATURES

The drawings are objected to under 37 C.F.R. § 1.83(a) since the drawings must show every feature of the invention specified in the claims, and therefore various features must be shown or canceled from the claims.

The Examiner asserts that the limitation in claims 3, 11 and 22 "the first housing portion is spaced from the upper surface" is not shown in the drawings and must be shown or canceled from these claims. This is clearly erroneous.

The upper surface is illustrated as surface 112 of chip 110 in Fig. 1B, and the first housing portion is illustrated as encapsulant 156 in Figs. 6A to 6D. Surface 112 of chip 110 contacts and is covered by transparent adhesive 154 in Fig. 5A. As a result, encapsulant 156 is spaced from surface 112 of chip 110, as shown in Figs. 6C, 6D, 7C, 7D, 9B, 10B, 11B, 12B, 12C, 13B and 14B.

The Examiner asserts that the limitation in claims 12, 17, 32, 37, 52 and 57 "the first surface contacts the light sensitive cell and the conductive trace, and the second surface . . . is exposed" is not shown in the drawings and must be shown or canceled from these claims.

Claims 12, 17, 32, 37, 52 and 57 have been amended to recite that the first surface contacts the light sensitive cell and "is spaced from" the conductive trace, and the second surface . . . is exposed.

The Examiner asserts that the limitation in claims 16, 26, 36 and 46 "the insulative housing consisting of the first and second housing portions" is not shown in the drawings and must be shown or canceled from these claims.

The first housing portion is illustrated as encapsulant 156 in Figs. 6A to 6D, the second housing portion is illustrated as transparent base 182 in Fig. 12B, and the insulative housing is illustrated as insulative housing 184 that includes encapsulant base 156 and transparent base 182 in Fig. 12B. Thus, an insulative housing that consists of encapsulant 156 and transparent base 182 meets the limitations of (1) claim 26 since claim 21 recites that the second housing portion contacts the upper surface, and (2) claim 46 since claim 41 recites that the second housing portion covers the light sensitive cell.

The second housing portion is also illustrated by the combination of transparent adhesive 154 in Fig. 4A and transparent base 182 in Fig. 12B, in which case the insulative housing is illustrated as transparent adhesive 154, encapsulant 156 and transparent base 182. Thus, an insulative housing that consists of transparent adhesive 154, encapsulant 156 and transparent base 182 meets the limitations of (1) claim 16 since claim 11 recites that the second housing portion contacts the light sensitive cell, (2) claim 26 since claim 21 recites that the second housing portion contacts the upper surface, (3) claim 36 since claim 31 recites that the second housing portion is a single-piece or double-piece that contacts the light sensitive cell, and (4) claim 46 since claim 41 recites that the second housing portion covers the light sensitive cell.

Therefore, Applicant requests that these objections be withdrawn.

III. DRAWING OBJECTIONS – IMPROPER REFERENCE CHARACTERS

The drawings are objected to under 37 C.F.R. § 1.84(p)(4) due to improper reference characters.

The Examiner asserts that reference character 132 in Fig. 2A has been used to designate both the recessed and non-recessed portion. Reference character 132 in Fig. 2A only points to the recessed portion. However, in the interests of expediting the case, the Submission Of Proposed Drawing Amendment For Approval By Examiner filed concurrently herewith proposes relocating reference character 132 so that the lead line does not overlap the non-recessed portion.

The Examiner asserts that reference characters 138 and 156 in Fig. 6B have both been used to designate leads. The Submission Of Proposed Drawing Amendment For Approval By Examiner filed concurrently herewith proposes that reference character 156 point to encapsulant 156.

The Examiner asserts that reference characters 164 and 166 in Fig. 12C have both been used to designate top surfaces. This is clearly erroneous. Encapsulant 156 includes bottom surface 160, four peripheral side surfaces 162 and top surface 164. Encapsulant 156 also includes peripheral portion 166 which provides a peripheral ledge that surrounds central portion 126, as shown in Fig. 6B. Insulative housing 184 also includes top surface 164 formed by peripheral portion 166 and transparent base 182. Thus, top surface 164 differs from peripheral portion 166, and reference characters 164 and 166 designate different features.

The Examiner asserts reference characters 184 and 186 in Fig. 13A have both been used to designate the device. This is clearly erroneous. Insulative housing 184 includes encapsulant 156 and transparent base 182. Device 186 includes chip 110, conductive traces 150, transparent adhesive 154, connection joints 180 and insulative housing 184. Thus, insulative housing 184 differs from device 186, and reference characters 184 and 186 designate different features.

Therefore, Applicant requests that these objections be withdrawn.

IV. SPECIFICATION OBJECTION

The Specification is objected since it lacks inadequate description.

The Examiner asserts that the Specification needs a brief description of the drawings for Figs. 13A to 14B.

Figs. 1A-14A and 1B-14B are bottom and top perspective views, respectively, of a method of making an optoelectronic semiconductor package device.

The Specification provides a brief description of Figs. 13A to 14B in the Brief Description of the Drawings as follows:

> FIGS. 1A-14A are bottom perspective views that show a method of making an optoelectronic semiconductor package device in accordance with an embodiment of the present invention;
>
> FIGS. 1B-14B are top perspective views corresponding to FIGS. 1A-14A, respectively; (Page 6, lines 4-7.)

Therefore, the Brief Description of the Drawings accurately and concisely describes Figs. 13A to 14B.

The Brief Description of the Drawings need not describe each figure individually. For instance, no such requirement exists in the Rules or the Manual of Patent Examining Procedure. See 37 C.F.R. § 1.74 and M.P.E.P § 608.01(f).

Furthermore, it is common for the brief description of the drawings to summarize multiple figures without describing each figure individually. See, for instance, U.S. Patent No. 5,834,835 to *Maekawa*, U.S. Patent No. 5,834,843 to *Mori et al.*, and U.S. Patent No. 5,859,471 to *Kuraishi et al.*, all cited by the Examiner.

Therefore, Applicant requests that this objection be withdrawn.

V. SECTION 112, FIRST PARAGRAPH REJECTIONS

Claims 12, 16, 17, 26, 32, 36, 37, 46, 52 and 57 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Examiner asserts that the Specification fails to disclosure the limitation in claims 12, 17, 32, 37, 52 and 57 "the first surface contacts the light sensitive cell and the conductive trace and the second surface . . . is exposed."

Claims 12, 17, 32, 37, 52 and 57 have been amended to recite that the first surface contacts the light sensitive cell and "is spaced from" the conductive trace, and the second surface . . . is exposed.

The Examiner asserts that the Specification fails to disclose the limitation in claims 16, 26, 36 and 46 "the insulative housing consisting of the first and second housing portions."

The first housing portion is illustrated as encapsulant 156 in Figs. 6A to 6D, the second housing portion is illustrated as transparent base 182 in Fig. 12B, and the insulative housing is illustrated as insulative housing 184 that includes encapsulant base 156 and transparent base 182 in Fig. 12B. Thus, an insulative housing that consists of encapsulant 156 and transparent base 182 meets the limitations of (1) claim 26 since claim 21 recites that the second housing portion contacts the upper surface, and (2) claim 46 since claim 41 recites that the second housing portion covers the light sensitive cell.

The second housing portion is also illustrated by the combination of transparent adhesive 154 in Fig. 4A and transparent base 182 in Fig. 12B, in which case the insulative housing is illustrated as transparent adhesive 154, encapsulant 156 and transparent base 182. Thus, an insulative housing that consists of transparent adhesive 154, encapsulant 156 and transparent base 182 meets the limitations of (1) claim 16 since claim 11 recites that the second housing portion contacts the light sensitive cell, (2) claim 26 since claim 21 recites that the second housing portion contacts the upper surface, (3) claim 36 since claim 31 recites that the second

housing portion is a single-piece or double-piece that contacts the light sensitive cell, and (4) claim 46 since claim 41 recites that the second housing portion covers the light sensitive cell.

The Specification elaborates on the insulative housing as follows:

> The insulative housing can include a wide variety of insulative housing portions. For example, if a transparent adhesive contacts the light sensitive cell, and a transparent base contacts the transparent adhesive and is spaced from the light sensitive cell, then the encapsulant provides a first single-piece housing portion, the transparent base provides a second single-piece housing portion, the transparent adhesive provides a third single-piece housing portion, and the transparent adhesive and transparent base provide an optical window for the light sensitive cell. As another example, if a non-transparent adhesive is spaced from the light sensitive cell, and a transparent base contacts the light sensitive cell, then the encapsulant provides a first single-piece housing portion, the transparent base provides a second single-piece housing portion, and the transparent base alone provides an optical window for the light sensitive cell. As another example, if a transparent adhesive contacts the light sensitive cell, and the transparent base is omitted such that a side of the transparent adhesive opposite the chip is exposed, then the encapsulant provides a first single-piece housing portion, the transparent adhesive provides a second single-piece housing portion, and the transparent adhesive alone provides an optical window for the light sensitive cell. (Page 25, line 20 to page 26, line 3.)

In each example, an insulative housing can consist of a first single-piece non-transparent housing portion and a second transparent housing portion that (1) contacts the light sensitive cell, (2) contacts the upper surface, (3) is a single-piece or double-piece that contacts the light sensitive cell, and (4) covers the light sensitive cell.

In the first example, the encapsulant can provide the first housing portion, and the transparent base and the transparent adhesive in combination can provide the second housing portion. In the second example, the encapsulant can provide the first housing portion, and the transparent base alone can provide the second housing portion. In the third example, the encapsulant can provide the first housing portion, and the transparent adhesive alone can provide the second housing portion.

The first example is illustrated in the drawings by transparent adhesive 154, encapsulant 156 and transparent base 182 in Fig. 12B.

The second example is not illustrated in the drawings. However, the Specification elaborates on the adhesive as follows:

> A non-transparent adhesive can also be used. Preferably, a non-transparent adhesive does not contact or cover any portion of the light sensitive cell. For example, a non-transparent adhesive can be formed on the metal base as a peripheral ledge with a central opening, the chip can be positioned so that the non-transparent adhesive contacts the pads without contacting the light sensitive cell, and then the transparent base can be deposited on the light sensitive cell. As another example, a non-transparent adhesive can be deposited on the metal base, the chip can be positioned so that the non-transparent adhesive contacts the pads and the light sensitive cell, the portion of the non-transparent adhesive that contacts the light sensitive cell can be removed, for instance by selective laser ablation or blanket plasma etching as the pads are exposed, and then the transparent base can be deposited on the light sensitive cell. (Page 24, lines 19-28.)

Thus, the second example can be provided by providing a non-transparent adhesive that contacts the pads without contacting or covering the light sensitive cell, in which case the transparent base contacts and covers the light sensitive cell.

The third example is not illustrated in the drawings. However, the third example can be provided by omitting insulative base 182 in Figs. 12A to 12C. That is, proceeding from forming connection joints 180 in Figs. 11A to 11E directly to removing metal base 120 outside leads 138 in Figs. 13A and 13B.

Thus, the Specification is replete with examples that would enable one of ordinary skill in the art to make and/or use the invention set forth in claims 16, 26, 36 and 46.

Therefore, Applicant requests that these rejections be withdrawn.

VI. SECTION 102 REJECTIONS

Claims 1-40 are rejected under 35 U.S.C. § 102(b) as being anticipated by *Nakamura et al.* (U.S. Patent No. 5,405,809).

Nakamura et al. discloses an image sensor device that includes light-transmitting substrate 21, circuit conductor layer 22, plated metal layer 23, metal bump 24, image sensor chip 26, resin coating 27 and transparent resin 28. Image sensor chip 26 includes electrode 25 and light-sensitive element 29.

Metal bump 24 is a metal such as Au that is formed on electrode 25 by plating or ball bonding, and then image sensor chip 26 is cut out from a silicon wafer.

Circuit conductor layer 22 is a metal such as Cu or Al that is formed on light-transmitting substrate 21. For instance, circuit conductor layer 22 may be formed by depositing a metal layer on light-transmitting substrate 21 by sputtering, vapor deposition and the like and then patterning the metal layer using photolithography. Alternatively, circuit conductive layer 22 may be formed by attaching a flexible printed wiring board to light-transmitting substrate 21 or by thick-film printing.

Plated metal layer 23 is then formed on a prescribed portion of circuit conductor layer 22.

Transparent resin 28 is then applied to a prescribed portion of light-transmitting substrate 21, and then image sensor chip 26 is disposed face-down on transparent resin 28 so that plated metal layer 23 abuts electrode 25. While image sensor chip 26 is pressed onto light-transmitting substrate 21, transparent resin 28 is irradiated with ultra violet rays through light-transmitting substrate 21 and partially cured.

The structure is then placed in an oven that melts plated metal layer 23 and further cures transparent resin 28. Plated metal layer 23 melts and recoagulates so that alloy layers are formed in abutting portions between circuit conductor layer 22 and plated metal layer 23, and in abutting portions between plated metal layer 23 and metal bump 24.

Finally, resin coating 27 such as silicon is dispensed on light-transmitting substrate 21 and image sensor chip 26.

Claim 1 recites "the first housing portion includes a peripheral ledge, and the second housing portion is located within the peripheral ledge and is exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 is not located within a peripheral ledge of resin coating 27, and transparent resin 28 is not exposed.

Claim 11 recites that the conductive trace "extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27.

Claim 21 recites that the insulative housing that includes a top surface, a bottom surface and "uncurved" peripheral side surfaces between the top and bottom surfaces. *Nakamura et al.* fails to teach or suggest this approach. Resin coating 27 has curved peripheral side surfaces.

Claim 31 recites that the second housing portion is a single-piece or double-piece that provides a central portion of the top surface within the peripheral portion of the top surface, contacts the first housing portion, the light sensitive cell and the conductive trace, is spaced from the lower surface, is transparent and is "exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 is not located within a peripheral portion of the top surface, and transparent resin 28 is not exposed.

Accordingly, claims 1-40 distinguish over *Nakamura et al.*, and the amendments to claims 1, 11, 21 and 31 render the outstanding rejections moot.

The dependent claims recite additional distinctions over *Nakamura et al.* Some but not all of these distinctions are discussed below.

Claim 13 recites "the first housing portion includes a peripheral ledge, and the second housing portion is located within the peripheral ledge." Claims 17, 24 and 33 recite similar limitations. *Nakamura et al.* fails to teach or suggest that light-transmitting substrate 21 or transparent resin 28 is located within a peripheral ledge of resin coating 27. Instead, light-

transmitting substrate 21 does not extend into resin coating 27, and transparent resin 28 protrudes from resin coating 27. In sustaining this rejection, the Examiner asserts that transparent resin 28 is located within a peripheral ledge of resin coating 27. This is clearly erroneous. Transparent resin 28 protrudes from resin coating 27, and therefore cannot be located within a peripheral ledge of resin coating 27.

Claim 14 recites "the second housing portion is recessed relative to the peripheral ledge." Claims 6, 24 and 33 recite similar limitations. *Nakamura et al.* fails to teach or suggest that light-transmitting substrate 21 or transparent resin 28 is recessed relative to a peripheral ledge of resin coating 27. Instead, light-transmitting substrate 21 does not extend into resin coating 27, and transparent resin 28 protrudes from resin coating 27. In sustaining this rejection, the Examiner asserts that transparent resin 28 is recessed relative to a peripheral ledge of resin coating 27. This is clearly erroneous. Transparent resin 28 protrudes from resin coating 27, and therefore cannot be recessed relative to a peripheral ledge of resin coating 27.

Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in the prior art. *Akzo N.V. v. United States International Trade Commission*, 1 USPQ 2d 1241, 1245 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). That is, the reference must teach every aspect of the claimed invention. See M.P.E.P. § 706.02.

Nakamura et al. fails to teach or suggest limitations of independent claims 1, 11, 21 and 31 as well as limitations of various rejected dependent claims. Therefore, Applicant requests that these rejections be withdrawn.

VII. SECTION 103 REJECTIONS

Claims 41-60 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nakamura et al.* in view of *Kuraishi et al.* (U.S. Patent No. 5,859,471).

Kuraishi et al. addresses TAB leads with insufficient outer lead strength:

However, as mentioned above, since a TAB tape includes a plurality of leads which are made of conductive thin film, there has been a problem that the leads are not of sufficient strength and it is difficult to handle same, such as when the product is mounted on a printed circuit board. (Col. 1, lines 48-52.)

In addition, after the leads have been formed, it is necessary to prevent the leads from being deformed or bent. Thus, it becomes necessary that the outer leads have a certain strength to stably and accurately mount the product on a printed circuit board without any deformation of the leads. (Col. 1, lines 58-63.)

Kuraishi et al. solves the problem by coating the outer leads to increase the strength of the outer leads:

According to one aspect of the present invention . . . said outer leads being coated with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 2, lines 5-13.)

According to another aspect of the present invention . . . said outer leads being coated with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 2, lines 14-23.)

According to still another aspect of the present invention . . . coating said outer leads with metal layers to increase the thickness of said outer leads, so that a desired strength of said outer leads is obtained. (Col. 2, lines 24-34.)

According to further aspect of the present invention . . . coating said outer leads with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 2, lines 35-48.)

According to still further aspect of the present invention . . . coating said outer leads with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 2, lines 49-63.)

According to still another aspect of the present invention . . . said outer leads being coated with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 2, line 64 to col. 3, line 5.)

> According to still another aspect of the present invention . . . said outer leads being coated with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 3, lines 9 to 22.)
>
> According to still another aspect of the present invention . . . said outer leads being coated with metal layers to increase the thickness thereof, so that a desired strength of said outer leads is obtained. (Col. 3, lines 27 to 39.)

Kuraishi et al. discloses a TAB tape lead frame that includes base film 10 and a conductive pattern. Base film 10 includes window holes 14 and sprocket holes 16. The conductive pattern includes inner leads 18 and outer leads 20.

In an inner lead bonding type TAB tape shown in Figs. 1A and 1B, base film 10 includes device hole 12. In a wire bonding type TAB tape shown in Figs. 1C and 1D, the conductive pattern includes die pad 28. Both types of TAB tape can include tie bar 20a shown in Figs. 1B and 1D.

Outer leads 20 are subsequently plated with copper to increase strength:

> In each of the above types of TAB tapes, the thickness of the conductive part of the outer lead is increased, in such a manner that the outer lead has a thickness substantially the same as the outer lead of a conventional lead frame. . . . As the thickness of outer leads 20 is increased, as shown in FIGS. 3 and 4, by the copper-plating, the strength can also be increased to substantially the same level as a conventional metal lead frame. (Col. 5, lines 5-19.)
>
> As shown in FIGS. 3 and 4, the thickness of the outer leads 20 is increased by copper-plating, so that the strength of the outer leads 20 is substantially the same as that of a conventional metal lead frame. Therefore, the outer lead portions 20 can easily be handled, and bent, so that the semiconductor device using such a lead frame of the embodiments can easily be mounted on a circuit board (not shown). (Col. 5, line 66 to col. 6, line 6.)

Claim 41 recites "a conductive trace that protrudes laterally from and extends through the side surface and is electrically connected to the pad, wherein the conductive trace includes a recessed portion that extends into the insulative housing and is spaced from the top and bottom surfaces and a non-recessed portion that extends outside the insulative housing and is adjacent to the recessed portion and the top surface." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not include a recessed portion. *Kuraishi et al.* fails to cure this deficiency. There is no teaching, suggestion or motivation to modify *Nakamura et al.* by coating circuit conductor layer 22 to increase strength as taught by *Kuraishi et al.*, and even if there was, the proposed modification would not meet the claim limitations.

In sustaining this rejection, the Examiner states as follows:

> Nakamura et al. does not disclose the conductive trace including a recessed portion that extends through the side surface and is spaced from the top and bottom surfaces and a non-recessed portion that extends outside the insulative housing and is adjacent to the recessed portion at a corner between the side surface and the top surface. However, Kuraishi et al. discloses in Fig. 3 a conductive trace (20) including a recessed portion (18) that extends outside an insulative housing (26) and is adjacent to the recessed portion and a corner between the side surface and the top surface. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakamura et al. by using the conductive trace as taught by Kuraishi et al. The ordinary artisan would have been motivated to modify Nakamura et al. in the manner described above for at least the purpose of providing a fine pattern of inner leads (column 2, lines 8-9).

The rejection is flawed for several reasons.

First, there is no teaching, suggestion or motivation for the proposed modification.

Kuraishi et al. discloses coating the outer leads of TAB leads so that the outer leads are strengthened and thus more robust when they are handled and bent. *Kuraishi et al.* fails to teach or suggest coating a circuit conductor pattern that is mounted on and fully supported by a substrate. Therefore, *Kuraishi et al.* fails to teach or suggest coating circuit conductor layer 22 in *Nakamura et al.*

The Examiner states that transparent resin 28 provides the second housing portion and implies that coating circuit conductor layer 22 provides the conductive trace. This is clearly erroneous. The portion of circuit conductor layer 22 that contacts transparent resin 28 is adjacent to the top surface of transparent resin 28, regardless of whether the portion of circuit conductor layer 22 that is spaced from transparent resin 28 is coated with a metal layer.

The Examiner also states that in *Kuraishi et al.*, at Fig. 3, outer lead 20 is adjacent to the top surface of resin 26. This is clearly erroneous. Outer lead 20 protrudes from the side surface of resin 26 and is not adjacent to the top surface of resin 26. Furthermore, as best Applicant can tell, the rejection is based on modifying circuit conductor layer 22 in *Nakamura et al.* with the outer lead coating in *Kuraishi et al.* Therefore, the position of outer lead 20 relative to resin 26 is irrelevant.

Claim 51 recites "a conductive trace that protrudes laterally from and extends through the side surface and is electrically connected to the pad, wherein the conductive trace includes a recessed portion that extends into the insulative housing and is spaced from the top and bottom surfaces and a non-recessed portion that extends outside the insulative housing and is adjacent to the recessed portion and contacts the insulative housing, wherein the recessed and non-recessed portions each include four outer surfaces, three of the outer surfaces of the recessed and non-recessed portions that do not face in the same direction as the top surface are coplanar with one another where the recessed and non-recessed portions are adjacent to one another, and one of the outer surfaces of the recessed and non-recessed portions that face in the same direction as the top surface are not coplanar with one another where the recessed and non-recessed portions are adjacent to one another." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not include a recessed portion. *Kuraishi et al.* fails to cure this deficiency. There is no teaching, suggestion or motivation to modify *Nakamura et al.* by coating circuit conductor layer 22 to increase strength as taught by *Kuraishi et al.*, and even if there was, the proposed modification would not meet the claim limitations.

Likewise, there is no motivation for the proposed modification. In *Kuraishi et al.*, the motivation for coating the outer leads is that the outer leads are dangling and may not have sufficient strength to absorb handling and bending, for instance when a semiconductor device that uses the outer leads is mounted on a circuit board. In *Nakamura et al.*, on the other hand, these concerns to not arise. Circuit conductor layer 22 does not dangle or laterally protrude from light-transmitting substrate 21. Instead, the entire circuit conductor layer 22 is mounted on and supported by light-transmitting substrate 21. Furthermore, *Nakamura et al.* gives no indication that circuit conductor layer 22 can be bent, or is subject to handling, or needs strengthening, or mechanically supports the image sensor device during the next level assembly.

The Examiner states that the motivation for the proposed combination is to provide a fine pattern of inner leads. This is clearly erroneous. In *Kuraishi et al.*, inner leads 18 and outer leads 20 are patterned by etching the conductive pattern. Thereafter, outer leads 20 are coated and thickened in order to increase strength. Thus, the coating step is not intended to provide a fine pattern for inner leads 18, but rather to thicken and strengthen outer leads 20.

Second, even if the proposed modification were made (although there is no teaching, suggestion or motivation to do so), the proposed modification would not meet the claim limitations.

Claim 41 recites that the recessed portion is spaced from the top surface and the non-recessed portion is adjacent to the top surface. In *Nakamura et al.*, even if a coating was deposited on the exposed portion of circuit conductor layer 22, such that circuit conductor layer 22 included a recessed portion within resin coating 27 and a non-recessed portion outside resin coating 27, either the recessed portion would be adjacent to the top surface (if light-transmitting substrate 21 is excluded from the insulative housing) or the non-recessed portion would be spaced from the top surface (if light-transmitting substrate 21 is included in the insulative housing). In either case, the proposed modification does not meet the claim limitations.

In sustaining this rejection, the Examiner states as follows:

> Nakamura et al. does not disclose the conductive trace including a recessed portion inside the insulative housing that extends through the side surface and is spaced from the top and bottom surfaces and a non-recessed portion outside the insulative housing that is adjacent to and integral with the recessed portion and contacts the side surface and is adjacent to a corner between the side surface and the top surface. However, Kuraishi et al. discloses in Fig. 3 a conductive trace (20) including a recessed portion (18) inside an insulative housing (26) that extends through a side surface and is spaced from a top and bottom surfaces and a non-recessed portion outside the insulative housing that is adjacent to and integral with the recessed portion and contacts the side surface and is adjacent to a corner between the side surface and the top surface. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakamura et al. by using the conductive trace as taught by Kuraishi et al. The ordinary artisan would have been motivated to modify Nakamura et al. in the manner described above for at least the purpose of providing a fine pattern of inner leads (column 2, lines 8-9).

The rejection is flawed for several reasons.

First, there is no teaching, suggestion or motivation for the proposed modification, as explained above for claim 41.

Second, even if the proposed modification were made (although there is no teaching, suggestion or motivation to do so), the proposed modification would not meet the claim limitations.

Claim 51 recites that the recessed and non-recessed portions each include four outer surfaces, three of the outer surfaces of the recessed and non-recessed portions that do not face in the same direction as the top surface are coplanar with one another where the recessed and non-recessed portions are adjacent to one another, and one of the outer surfaces of the recessed and non-recessed portions that face in the same direction as the top surface are not coplanar with one another where the recessed and non-recessed portions are adjacent to one another. In *Nakamura et al.*, even if a coating was deposited on the exposed portion of circuit conductor layer 22, such

that circuit conductor layer 22 included a recessed portion within resin coating 27 and a non-recessed portion outside resin coating 27, three of the outer surfaces of the recessed and non-recessed portions would not be coplanar with one another. The three outer surfaces that do not face towards light-transmitting substrate 21 would not be coplanar with one another, and only the outer surfaces that face towards and contact light-transmitting substrate 21 would remain coplanar with one another. Thus, the proposed modification does not meet the claim limitations.

Accordingly, claims 41-60 distinguish over *Nakamura et al.* in view of *Kuraishi et al.*

The dependent claims recite additional distinctions over *Nakamura et al.* Some but not all of these distinctions are discussed below.

Claim 44 recites "the first housing portion includes a peripheral ledge, and the second housing portion is located within the peripheral ledge." Claim 57 recites similar limitations. *Nakamura et al.* fails to teach or suggest that light-transmitting substrate 21 or transparent resin 28 is located within a peripheral ledge of resin coating 27. Instead, light-transmitting substrate 21 does not extend into resin coating 27, and transparent resin 28 protrudes from resin coating 27. In sustaining this rejection, the Examiner asserts that transparent resin 28 is located within a peripheral ledge of resin coating 27. This is clearly erroneous. Transparent resin 28 protrudes from resin coating 27, and therefore cannot be located within a peripheral ledge of resin coating 27.

Claim 53 recites "the second housing portion is located within and recessed relative to the peripheral ledge." *Nakamura et al.* fails to teach or suggest that light-transmitting substrate 21 or transparent resin 28 is recessed relative to a peripheral ledge of resin coating 27. Instead, light-transmitting substrate 21 does not extend into resin coating 27, and transparent resin 28 protrudes from resin coating 27. In sustaining this rejection, the Examiner asserts that transparent resin 28 is recessed relative to a peripheral ledge of resin coating 27. This is clearly erroneous. Transparent resin 28 protrudes from resin coating 27, and therefore cannot be recessed relative to a peripheral ledge of resin coating 27.

To establish prima facie obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. See M.P.E.P. § 2142.

It is insufficient that the prior art shows similar components unless it also contains some teaching, suggestion or incentive for arriving at the claimed structure. See *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 934 (Fed. Cir. 1990).

Nakamura et al. fails to teach or suggest limitations of independent claims 41 and 51 as well as limitations of various rejected dependent claims, and *Kuraishi et al.* fails to cure these deficiencies. Therefore, Applicant requests that these rejections be withdrawn.

VIII. NEW CLAIMS

Claims 61-150 have been added to further explicate various features of the invention. No new matter has been added.

Claim 61 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 62-65 depend from claim 61.

Claim 66 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 67-70 depend from claim 66.

Claim 71 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 72-75 depend from claim 71.

Claim 76 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 77-80 depend from claim 76.

Claim 81 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 82-85 depend from claim 81.

Claim 86 recites "a conductive trace that extends through an opening in the first housing portion." *Nakamura et al.* fails to teach or suggest this approach. Circuit conductor layer 22 does not extend through an opening in resin coating 27. Claims 87-90 depend from claim 86.

Claim 91 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, and the top surface is exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 does not provide a central portion of the top surface within a peripheral portion of the top surface, and transparent resin 28 is not exposed. Claims 92-95 depend from claim 91.

Claim 96 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, the first housing portion is exposed at the top surface, bottom surface and peripheral side surfaces, and the second housing portion is exposed at the top surface." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 does not provide a central portion of the top surface within a peripheral portion of the top surface, and transparent resin 28 is not exposed. Claims 97-100 depend from claim 96.

Claim 101 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, the central portion of the top surface is recessed relative to the peripheral portion of the top surface, and the top surface is exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 is not located within a peripheral

portion of the top surface, and transparent resin 28 is not exposed. Furthermore, neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 102-105 depend from claim 101.

Claim 106 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, the central portion of the top surface is recessed relative to the peripheral portion of the top surface, the first housing portion is exposed at the top surface, bottom surface and peripheral side surfaces, and the second housing portion is exposed at the top surface." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 does not provide a central portion of the top surface within a peripheral portion of the top surface, and transparent resin 28 is not exposed. Furthermore, neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 107-110 depend from claim 106.

Claim 111 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, and the top, bottom and peripheral side surfaces are exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 does not provide a central portion of the top surface within a peripheral portion of the top surface, and transparent resin 28 is not exposed. Claims 112-115 depend from claim 111.

Claim 116 recites "the second housing portion contacts the first housing portion and the light sensitive cell, provides a central portion of the top surface within the peripheral portion of the top surface and is transparent, and the top, bottom and peripheral side surfaces are exposed." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 does not provide a central portion of the top surface within a peripheral portion of the top surface, and transparent resin 28 is not exposed. Claims 117-120 depend from claim 116.

Claim 121 recites "the second housing portion is located within and recessed relative to the peripheral ledge, contacts the light sensitive cell and is transparent." *Nakamura et al.* fails to

teach or suggest this approach. Neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 122-125 depend from claim 121.

Claim 126 recites "the second housing portion is located within and recessed relative to the peripheral ledge, contacts the light sensitive cell and is transparent, the first housing portion is exposed at the top surface, bottom surface and peripheral side surfaces, and the second housing portion is exposed at the top surface." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 is not located within a peripheral ledge of resin coating 27, and transparent resin 28 is not exposed. Furthermore, neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 127-130 depend from claim 126.

Claim 131 recites "the second housing portion is located within and recessed relative to the peripheral ledge, contacts the light sensitive cell and the inner side surfaces and is transparent." *Nakamura et al.* fails to teach or suggest this approach. Neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 132-135 depend from claim 131.

Claim 136 recites "the second housing portion is located within and recessed relative to the peripheral ledge, contacts the light sensitive cell and the inner side surfaces and is transparent, the first housing portion is exposed at the top surface, bottom surface and peripheral side surfaces, and the second housing portion is exposed at the top surface." *Nakamura et al.* fails to teach or suggest this approach. Light-transmitting substrate 21 is not located within a peripheral ledge of resin coating 27, and transparent resin 28 is not exposed. Furthermore, neither light-transmitting substrate 21 nor transparent resin 28 is recessed relative to resin coating 27. Claims 137-140 depend from claim 136.

Claim 141 recites "the first housing portion is a single-piece that covers the lower surface and the outer side surfaces and includes a top surface, a bottom surface, uncurved peripheral side surfaces between the top and bottom surfaces, a peripheral ledge at the top surface, and uncurved inner side surfaces inside the peripheral ledge opposite the peripheral side surfaces that extend from the top surface towards the bottom surface and are spaced from the bottom surface and is

non-transparent." *Nakamura et al.* fails to teach or suggest this approach. Resin coating 27 has curved peripheral side surfaces and curved inner side surfaces. Claims 142-145 depend from claim 141.

Claim 146 recites "the first housing portion is a single-piece that covers the lower surface and the outer side surfaces and includes a top surface, a bottom surface, uncurved peripheral side surfaces between the top and bottom surfaces, a peripheral ledge at the top surface, and uncurved inner side surfaces inside the peripheral ledge opposite the peripheral side surfaces that extend from the top surface towards the bottom surface and are spaced from the bottom surface and is non-transparent." *Nakamura et al.* fails to teach or suggest this approach. Resin coating 27 has curved peripheral side surfaces and curved inner side surfaces. Claims 147-150 depend from claim 146.

IX. OTHER AMENDMENTS

The Specification and Claims have been amended to improve clarity. No new matter has been added.

X. FEES

The fee for this Response is calculated below:

For	Claims Remaining After Amendment	Highest Number Previously Paid For		Extra Claims	Rate		Additional Fee
Total Claims	150	– 60	=	90	x $9	=	$810
Independent Claims	24	– 6	=	18	x $42	=	$756
Multiple Dep. Claim	0	0	$140			=	0
Total Fee						=	$1566

Please charge the $1566 to Deposit Account No. 502178/BDG005-3 and charge any underpayment or credit any overpayment to this Account.

XI. CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on April 25, 2003.

D Sigmond — 4/25/03

David M. Sigmond — Date of Signature
Attorney for Applicant

Respectfully submitted,

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